

# USER MANUAL

## VACUUM REGULATOR

CONTINUOUS

MODEL SERIES: PM3000



PM3100 (shown)  
PM3500  
PM3600

SAVE THESE INSTRUCTIONS

### CAUTION

Federal (USA) law restricts this device to sale by or on the order of a physician.

**PRECISION MEDICAL®**

300 Held Drive  
Northampton, PA 18067 USA

[www.precisionmedical.com](http://www.precisionmedical.com)

Your local distributor:  
**Medical Dynamics**  
TECHNOLOGY OF THE FUTURE, TODAY  
866-624-3952  
[www.thinkMDI.net](http://www.thinkMDI.net)

# CONTENTS

RECEIVING / INSPECTION.....	2
INTENDED USE .....	2
READ ALL INSTRUCTIONS BEFORE USING .....	2
EXPLANATION OF ABBREVIATIONS .....	2
SAFETY INFORMATION - WARNINGS AND CAUTIONS .....	2
SPECIFICATIONS .....	3
OPERATING INSTRUCTIONS.....	4
PARTS LIST .....	5
REPAIR KITS .....	6
DISASSEMBLY INSTRUCTIONS.....	6
ASSEMBLY INSTRUCTIONS .....	6
VACUUM REGULATOR CLEANING ILLUSTRATION .....	7
CLEANING / DECONTAMINATION.....	8
MAINTENANCE.....	8
RETURNS.....	8
DISPOSAL INSTRUCTIONS .....	9
TROUBLESHOOTING.....	9
LIMITED WARRANTY .....	10
DECLARATION OF CONFORMITY .....	11

## RECEIVING / INSPECTION

Remove the Precision Medical, Inc. Vacuum Regulator from the packaging and inspect for damage. If there is any damage, DO NOT USE and contact your Provider.

## INTENDED USE

The devices are intended to control and show the amount of vacuum from a central vacuum system used in various medical suctioning procedures.

## READ ALL INSTRUCTIONS BEFORE USING

This manual instructs a Professional to install and operate the Vacuum Regulator. This is provided for your safety and to prevent damage to the Vacuum Regulator. If you do not understand this manual, DO NOT USE the Vacuum Regulator and contact your Provider.

## EXPLANATION OF ABBREVIATIONS

lpm Liters Per Minute

mmHg Millimeters of Mercury

inHg Inches of Mercury

kPa Kilopascal

## SAFETY INFORMATION - WARNINGS AND CAUTIONS

### WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

### CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

### CAUTION

Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



CE  
0197

### CONSULT ACCOMPANYING DOCUMENTS

Symbol indicates the device complies with the requirements of Directive 93/42/EEC concerning medical devices and all applicable International Standards. (On CE marked Devices ONLY)

### WARNING

- **DO NOT** use this Vacuum Regulator for anything other than its Intended Use. Personal injury and/or damage to Regulator may result from misuse.
- Only personnel instructed and trained in its use should operate this Vacuum Regulator.

# SPECIFICATIONS

## GAUGE RANGE:

<b>PM3000:</b>	0 - 200 mmHg - Full Vacuum
<b>*PM3000E:</b>	0 - 200 mmHg (0 - 26 kPa)
<b>PM3000HV:</b>	0 - 300 mmHg - Full Vacuum
<b>PM3100:</b>	0 - 200 mmHg - Full Vacuum
<b>*PM3100E:</b>	0 - 200 mmHg (0 - 26 kPa)
<b>PM3100HV:</b>	0 - 300 mmHg - Full Vacuum
<b>PM3500:</b>	0 - 150 mmHg
<b>*PM3500E:</b>	0 - 200 mmHg (0 - 26 kPa)
<b>PM3600:</b>	0 - 760 mmHg

\* COUNTERCLOCKWISE DIRECTION

## GAUGE ACCURACY:

**Analog:**  $\pm 5\%$  of MAX

## Digital/Analog, Dual Gauge:

Digital Display:  $\pm 1\%$  of Full Scale

Analog Gauge:  $\pm 5\%$  of MAX within ref. Indicator

## VACUUM PORTS:

### MODES:

#### PM3100 & PM3600 Series:

LINE - Provides maximum, continuous vacuum from the vacuum source  
OFF - No Vacuum  
REG. - (Regulated) provides an adjustable, continuous vacuum level

#### PM3000 & PM3500 Series:

OFF - No Vacuum  
REG. - (Regulated) provides an adjustable, continuous vacuum level

FLOW: Models	Mode	Max Flow
<b>*PM3000, PM3100 &amp; PM3500:</b>	REG	51 lpm
	LINE	55 lpm
<b>**PM3600 SERIES:</b>	REG	71 lpm
	LINE	82 lpm

\* MAXIMUM FLOW IS OBTAINED WITH A VACUUM SOURCE OF 21" Hg (71.1 kPa)

\*\* MAXIMUM FLOW IS OBTAINED WITH A VACUUM SOURCE OF 25" Hg (84.6 kPa)

## MAXIMUM VACUUM:

<b>PM3000 &amp; PM3100:</b>	REG. Mode @ Full Vac-396 mmHg (53 kPa)
<b>PM3500D:</b>	Restricted to 170 mmHg (23 kPa)
<b>PM3500E:</b>	Restricted to 160 mmHg (21 kPa)
<b>PM3600:</b>	REG. Mode @ Full Vac-760 mmHg (101 kPa)

**Operating Environmental Limits:** 0°F to 122°F (-18°C to 50°C)

**Recommended Environmental Operating Limits:** 55°F to 85°F (13°C to 29°C)

## Storage Environmental Limits:

Temperature Range: -4°F to 140°F (-20°C to 60°C)

Humidity: Max 95% Noncondensing

**Battery:** 3 Volt Lithium, 1/2 AA

Specifications are subject to change without prior notice.

# OPERATING INSTRUCTIONS

## CAUTION

Inspect the Vacuum Regulator for visual damage before use, DO NOT USE if damaged.

**NOTE:** Overflow protection should be used with the Vacuum Regulator. (i.e. Filter, Vac Trap, Canister equipped with shut off).

1. Turn the Selector Knob to the "OFF" position.

2. Attach the Vacuum Regulator to the vacuum source.

A. REG MODE (Regulated Mode) **ALL MODELS**

1. Turn the Selector Knob to the "REG." position.

2. Block the bottom port of the Regulator.

3. Using the Regulator Knob, set the desired vacuum.

To **INCREASE** vacuum - Turn Knob **CLOCKWISE**

To **DECREASE** vacuum - Turn Knob **COUNTERCLOCKWISE**

B. LINE MODE (Full, unregulated vacuum)

**PM3100 & PM3600 SERIES ONLY**

1. Turn the Selector Knob to the "LINE" position.

3. Turn the Selector Knob to the "OFF" position to turn the Regulator off.

## ⚠WARNING

- When turning the Vacuum Regulator to "REG." from "LINE" or "OFF", the vacuum level will return to its previously regulated setting. Vacuum may be set at improper level for procedure.
- ALWAYS confirm vacuum setting prior to performing procedure.
- The vacuum CANNOT be regulated when the Selector Knob is set to the "LINE" position.
- Full Line Vacuum is present between settings.**

### REGULATE MODE

- Turn selector knob **fully** clockwise to the regulator mode and confirm vacuum setting before use.

### LINE MODE

- Turn the selector knob **fully** counterclockwise for line vacuum and confirm vacuum settings before use.

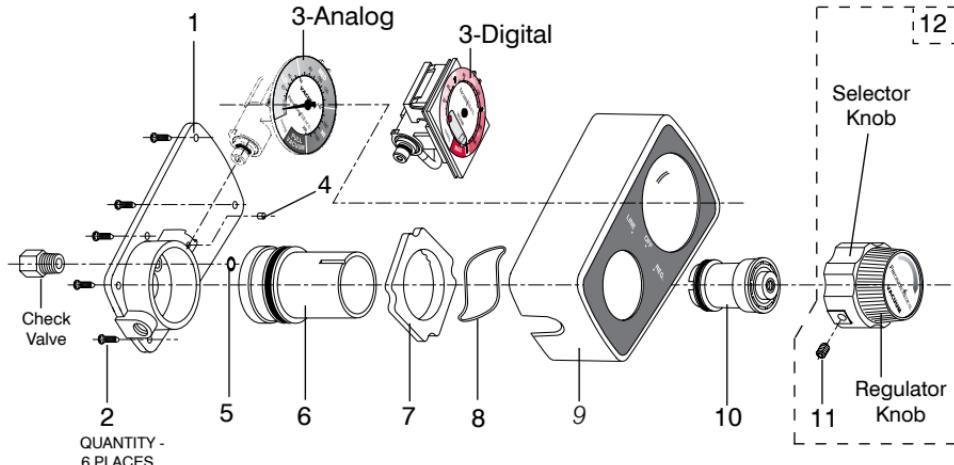
## ⚠CAUTION

**DO NOT** operate the Vacuum Regulator when the collection canister is "full". This may cause loss of vacuum and damage to the Vacuum Regulator. This will **void the warranty**.

## PARTS DESCRIPTION

### CAUTION

Missing or illegible labels must be replaced, contact Precision Medical, Inc.



### PARTS LIST

No.	Description	PM3000	PM3100	PM3500	PM3600
1	Housing Assembly			1561	
--	Check Valve	NA		502230	NA
2	Screw		503956 <b>(*505152)</b>		503956
3	Analog Gauge Assembly Analog Gauge Assembly (Export E) Analog Gauge Assembly (HV) Digital Assembly Digital Assembly (HV) Digital Assembly (Export E) Digital Assembly Export E (HV)	503694 503923 504309 505244 (0-200 mmHg) 505392 (0-300 mmHg) 506036 506038 (0-300 mmHg)	(*505163) 504225 505391 (0-150 mmHg)	503826 505162 506034	505937 505938 506040
4	Snubber			1396	
5	O-ring			1016	
6	Selector Assembly	1563	1564	1563	505935
7	Selector Ring			502685	
8	Wave Spring Washer		1614 <b>(*505154)</b>		1614
9	Case Assembly	1565	1566	1565	1566
10	Regulator Module Assembly	1567 <b>(*505164)</b> <b>(**505962)</b>		1567 <b>(*505164)</b>	505936
--	Washer (metal)	NA	NA	502818	NA
--	Washer (plastic)	NA	NA	503879	NA
11	Set Screw		1391 <b>(*505158)</b>		1391
12	Control Knob Assembly		1568 <b>(*505165)</b>		1568
--	Battery for Digital Assembly			8066	

\* MRI Models ONLY (PM3000MR, PM3100MR & PM3500MR)

\*\* HV Models ONLY (PM3000HV & PM3100HV)

## REPAIR KITS

	Analog Part#	Digital Part#
PM3000 / PM3000D Vac Reg	RK6000	RK6000D
PM3000E / PM3000DE Vac Reg	RK6000E	RK6000DE
PM3000HV/ PM3000DHV Vac Reg	RK6000HV	RK6000DHV
PM3000DEHV Vac Reg	N/A	RK6000DEHV
PM3100 / PM3100D Vac Reg	RK6100	RK6100D
PM3100E / PM3100DE Vac Reg	RK6100E	RK6100DE
PM3100HV / PM3100DHV Vac Reg	RK6100HV	RK6100DHV
PM3100DEHV Vac Reg	N/A	RK6100DEHV
PM3500 / PM3500D Vac Reg	RK6500	RK6500D
PM3500E / PM3500DE Vac Reg	RK6500E	RK6500DE
PM3600 / PM3600D Vac Reg	RK6600	RK6600D
PM3600DE Vac Reg	N/A	RK6600DE

*Not all Repair Kits are listed above, contact Precision Medical, Inc. for availability.*

## DISASSEMBLY INSTRUCTIONS

(Reference PARTS DESCRIPTION)

1. Loosen the Set Screw (Item# 11) in Selector Knob.
2. Pull the Control Knob Assembly (Item# 12) away from case. (The Regulator Module (Item# 10) is threaded onto the Control Knob Assembly.)
3. Remove the screws (Item# 2) from the back of the Regulator.
4. Separate the Case Assembly (Item# 9) by pulling it away from the Housing Assembly (Item# 1).
5. Remove the Selector Assembly (Item# 6) by pulling it away from the Housing Assembly.
6. Remove the Gauge Assembly (Item# 3).

## ASSEMBLY INSTRUCTIONS

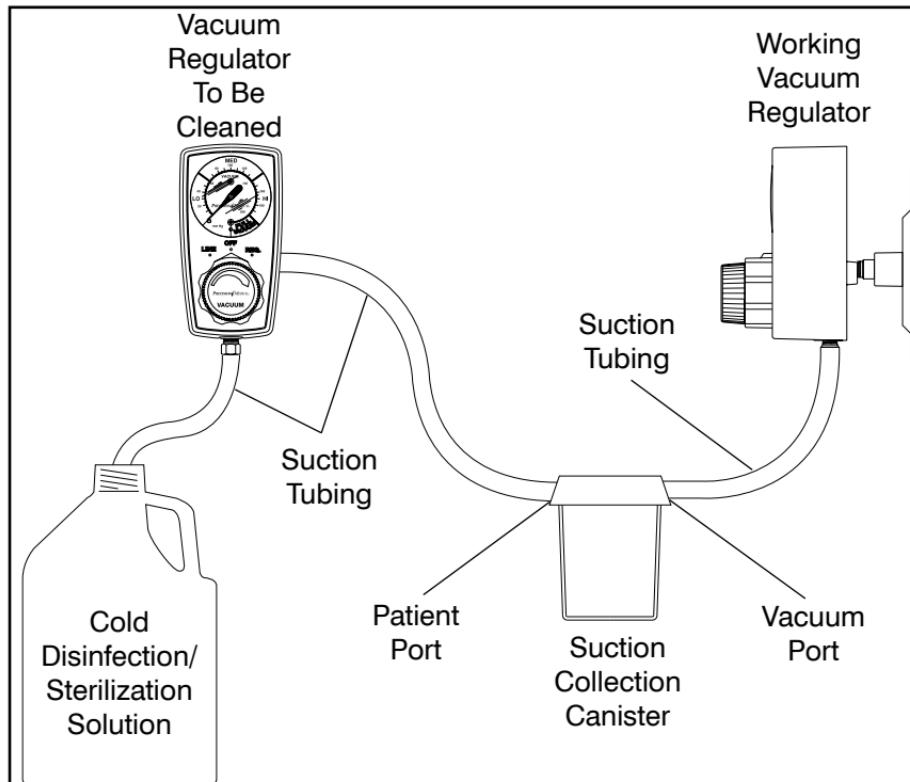
1. To assemble, perform the DISASSEMBLY INSTRUCTIONS in reverse order.

**NOTE:** • Ensure the Selector Assembly is inserted into the control knob assembly with the groove in the 12 o'clock position.  
• Ensure tabs and slots on various components are properly aligned and engaged when reassembling.

2. Lubricate all O-rings and cavities with Vacuum grease (part# 1775) supplied in the Vacuum Regulator Repair Kit.
3. Repeat steps 1 through 3 of OPERATING INSTRUCTIONS.
4. Prior to returning Vacuum Regulator to service verify accuracy of gauge.

# VACUUM REGULATOR CLEANING ILLUSTRATION

(Cleaning/Decontamination Instructions on **page 8**)



## CAUTION

- **DO NOT** autoclave or immerse in liquid. This will cause damage to the Vacuum Regulator and will **void the warranty**.
- If Vacuum Regulator becomes internally contaminated, warranty is voided, DO NOT send back to Precision Medical, Inc. for repair. Follow your facilities contaminated equipment protocol.
- Be sure all connections are tight and leak free.
- This Vacuum Regulator contains magnetic, ferrous material that may affect the results of an MRI.

**(Model Series: PM3000MR, PM3100MR & PM3500MR are MRI safe designated by MRI label.)**



## **CLEANING / DECONTAMINATION** (As needed)

1. Attach a working Vacuum Regulator with a continuous regulated mode to a minimum vacuum source of 15 inHg.
2. Mix cold disinfection/sterilization solution according to its manufacturer's directions.
3. Connect tubing as shown in Cleaning Illustration on previous page.
4. Turn the working Vacuum Regulator on to a continuous regulated mode.
5. Adjust the vacuum to a minimum of 120 mmHg.
6. Set the Vacuum Regulator to be cleaned to the "REG." mode, and set at 100 mmHg.
7. Allow cold disinfection/sterilization solution to pass through and collect in Suction Canister. Procedure should continue for time recommended by the manufacturer of the cold disinfection/sterilization solution for the desired level of disinfection or sterilization.
8. Turn the Vacuum Regulator to be cleaned to the "LINE" mode (if applicable).
9. Allow remaining cold disinfection/sterilization solution to pass through and collect in Suction Canister.
10. Set working Vacuum Regulator to its maximum vacuum setting.
11. Thoroughly dry the internal components by drawing maximum vacuum through the Regulator to be cleaned for at least 30 seconds in both "REG." and "LINE" modes (if applicable).

**NOTE:** If it is not possible to pass cold disinfection/sterilization solution through the Regulator, then the passageways are totally blocked and **DISASSEMBLY** of the Regulator is required. Be sure to follow your facilities' Biohazard protocol.

## **MAINTENANCE**

Before each use, visually inspect Vacuum Regulator for any sign of damage, DO NOT USE if damaged.

## **RETURNS**

Returned products require a Returned Goods Authorization (RGA) number, contact Precision Medical, Inc. All returns must be packaged in sealed containers to prevent damage. Precision Medical, Inc. will not be responsible for goods damaged in transit. Refer to Precision Medical, Inc. Return Policy available on the Internet, [www.precisionmedical.com](http://www.precisionmedical.com).

# DISPOSAL INSTRUCTIONS

Dispose of the Vacuum Regulator in accordance with the local regulations.

**Please Recycle**



## ⚠WARNING

Product should be cleaned before being disposed of. Potential for Biohazard.

## TROUBLESHOOTING

If the Vacuum Regulator fails to function, consult the Troubleshooting Table below. If problem cannot be solved, consult your Provider.

Problem	Probable Cause	Remedy
No vacuum at bottom port (gauge at zero)	1. Regulator turned "OFF" 2. Loose connection 3. No vacuum to Regulator 4. Clogged vacuum Port	1. a. Turn selector knob b. Adjust Regulator knob 2. Tighten connection 3. Connect to a known working vacuum source 4. Disassemble & clean
No vacuum at bottom port (gauge showing vacuum)	1. Clogged Regulator	1. Disassemble & clean
Vacuum at bottom port (No reading on gauge when port is blocked)	1. Defective Gauge	1. Replace Gauge
Gauge will not return to zero	1. Clogged Snubber 2. Damaged Regulator Module 3. Defective Gauge	1. Replace Snubber 2. Replace Regulator Module 3. Replace Gauge
Vacuum Regulator erratic	1. Dirty Regulator Module 2. Defective Regulator Module	1. Disassemble & clean, Lubricate O-ring 2. Replace Module
Stiff movement of Selector Knob	1. Dirty Regulator Module and/or Selector Module	1. Disassemble & clean, Lubricate O-rings
Digital gauge doesn't function	1. Dead battery	1. Replace battery

# **LIMITED WARRANTY AND LIMITATION OF LIABILITY**

Precision Medical, Inc. warrants that the Medical Vacuum Regulator (the Product) will be free of defects in workmanship and/or material for the following period:

Ten (10) years from date of shipment.

Should any failure to conform to this warranty appear within the applicable period, Precision Medical, Inc. shall, upon written notification thereof and substantiation that the goods have been stored, installed, maintained and operated in accordance with Precision Medical, Inc.'s instructions and standard industry practice, and that no modifications, substitutions, or alterations have been made to the goods, correct such defect by suitable repair or replacement at its own expense.

## **ORAL STATEMENTS DO NOT CONSTITUTE WARRANTIES.**

The representative of Precision Medical, Inc. or any retailers are not authorized to make oral warranties about the merchandise described in this contract, and any such statements shall not be relied upon and are not part of the contract for sale. Thus, this writing is a final, complete and exclusive statement of the terms of that contract.

## **THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESS OR IMPLIED.**

Precision Medical, Inc. shall not under any circumstances be liable for special, incidental or consequential damages including but not limited to lost profits, lost sales, or injury to person or property. Correction of non-conformities as provided above shall constitute fulfillment of all liabilities of Precision Medical, Inc. whether based on contract, negligence, strict tort or otherwise. Precision Medical, Inc. reserves the right to discontinue manufacture of any product or change product materials, designs, or specifications without notice.

Precision Medical, Inc. reserves the right to correct clerical or typographical errors without penalty.

# DECLARATION OF CONFORMITY

Manufacturer: Precision Medical, Inc.  
300 Held Drive, Northampton, PA 18067, USA  
CONTACT: Quality Manager  
Phone: 610-262-6090

Authorized European Representative: Emergo Europe (European Office)  
Molenstraat 15  
2513 BH, The Hague  
The Netherlands  
+31 (0) 70.345.8570  
+31 (0) 70.346.7299

Product: Vacuum Regulators

Model(s): PM3000E, PM3000DE, PM3000DEHV,  
PM3100E, PM3100DE, PM3100DE-MG,  
PM3100DEHV, PM3100DEIN, PM3100EIN,  
PM3500E, PM3500E-MG, PM3500DE,  
PM3600DE, PM3600E

MDD Class: IIa

Classification criteria: Clause 1.2 Rule 2 of Annex IX of MDD

As delivered, the object of the declaration described above is in conformity with the requirements of MDD 93/42/EEC Annex II.3 and the following documents:

<u>Document</u>	<u>Edition</u>
BS EN 1041	2008
EN 980	2008
EN ISO 10079-3	2009
EN ISO 14971	2007 2nd Ed

Notified Body: TÜV Rheinland Product Safety GmbH  0197

Certificate No.: HD60019110 0001

***ISO 13485 Certified***

  
0197

503443 Rev9 (E) 03/30/10 (?M) Printed in USA